DOCUMENT RESUME

ED 232 380 EC 152 678

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TITLE An Integrated Evaluation Approach for the Handicapped Child 0 to Three Years.
PUB DATE Apr 83
NOTE 17p.; Paper presented at the Annual International Convention of The Council for Exceptional Children (61st, Detroit, MI, April 4-8, 1983).
PUB TYPE Guides - Non-Classroom Use (055) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Auditory Tests; *Child Language; Clinical Diagnosis; Developmental Stages; Diagnostic Tests; Early Experience; *Handicap Identification; High Risk Persons; Infants; Intervention; Language Skills; *Multiple Disabilities; Screening Tests; *Speech Evaluation; *Vision Tests; Young Children

ABSTRACT

Techniques to assess the vision, hearing, and speech and language of multihandicapped children are briefly described. Interferences in normal vision functioning and development during infancy can be identified and intervention initiated early in the child's life. Obtaining an in-depth history from the parents is the first step. It is essential that all infants identified as "at-risk" or handicapped, nonverbal mentally impaired preschool children, and multihandicapped persons have comprehensive visual evaluations prior to any special education planning and/or programs. Behavioral as well as electrophysiologic techniques have clinical utility for hearing assessment of the infant and multihandicapped child. Testing with an observational technique is an alternative to conventional adult procedures. By the age of 2 years, some children can be conditioned to respond to pure tone audiometry via a play response to a stimulus. For speech and language assessment, informal evaluative methods are useful for the multihandicapped youngster. In cases of the nonverbal or unintelligible multihandicapped child, the pragmatic aspect of the child's communication skills (i.e., the intent) should be assessed. When a child fails to demonstrate any meaningful communicative skills, it will be necessary to rely on a cognitive assessment to evaluate the prelanguage level. Ordinal scales of psychological development are also helpful to assess the infant's speech and language. A list of 18 references is appended. (SEW)

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AN INTEGRATED EVALUATION APPROACH

FOR THE HANDICAPPED CHILD

0 TO THREE YEARS

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EC152678

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The early identification of a handicapping condition can help insure a child and his family receives prompt remedial and educational intervention. It is critical that children be seen as soon as possible if a disability is suspected.

The intent of this paper is to briefly describe techniques available to assess the vision, hearing, and speech and language of multi-handicapped children.

VISION ASSESSMENT

The need for Early Identification and Care of Vision Problems

In the vision care field today, just as in other aspects of health care, there is a strong trend toward preventive care as well as earlier identification of problems. Over the past two decades, the study of infant vision development has progressed more rapidly than many other areas of research. In fact more information has been learned about infant's vision and perception in that time than in all previous years

Many visual abilities that were believed to develop later in life have been clearly shown to develop much earlier. For example, newborns can see and discriminate shapes, patterns, and faces clearly

at a close distance within the first week of life, newborns can track and follow patterns accurately within the first week of life, and the newborn infant, by age five months, possesses almost adult level abilities in visual acuity, focusing (accommodation), and coordination of the two eyes (binocular vision and stereopsis).

All of these visual skills and functions can be tested in appropriately equipped eye care practitioner's offices and clinics. These procedures utilize standard equipment for the examination of the visual system as well as more sophisticated instrumentation and procedures for nonverbal testing of infants and multihandicapped children.

There is widespread agreement that identification of at-risk populations must be coupled with the responsibility for the implementation of programs that will prevent, ameliorate, and/or remediate the various handicapping conditions. Such services have been limited or relatively unavailable up to ten years ago. In fact, many vision problems of children under the age of two have gone and continue to go undetected by parents and doctors. The percentage of children routinely examined or appropriately screened for visual problems in the first six months of life is still extremely low in spite of the available knowledge and techniques. Progress in development in the first two years of life is now viewed as uniquely influential regarding the course of subsequent development lending urgency to the identification of, and planning for, those children whose learning potential is compromised or in danger of being compromised.

Our point is simply that interferences in normal vision

functioning and development during infancy that may lead to or contribute to delays in other areas of development and intellectual growth can be identified and intervention initiated early in the child's life.

Examination Procedures and their Implications

An in-depth history from the parents or guardians is the essential first step. The history should include analysis of prenatal factors, postnatal factors, genetic factors, and environmental factors that may have a direct or indirect affect on the child's vision.

The minimum comprehensive examination of infant's vision should assess the child's visual acuity, oculomotility (visual attention, tracking and following skills), refractive status (myopia, hyperopia, and astigmatism), binocularity (coordination of the two eyes), and ocular health.

Visual acuity can be assessed on a nonverbal basis utilizing analysis of eye movements and preferred looking techniques. The infant or child is carefully shown two patterns under controlled conditions and by analysis of where they look and for how long, decisions often can be made regarding the visual acuity level. More sophisticated procedures are also available utilizing electrodiagnostic techniques that measure changes in the electrical activity of the visual cortex which can then be related to visual acuity levels as the infant or child watches striped or check patterns.

With an ever increasing number of states now mandating and implementing special services for multihandicapped infants and severely mentally impaired children, there are greatly improved prospects for earlier intervention and gains in the educational process of developing these children to their fullest potential.

From numerous studies over the years, there clearly appears to be a significantly higher incidence of ocular disease, refractive errors, decreased visual acuities, disorders in oculomotility, and disruptions in binocular functioning among the mentally retarded, carebral palsy, and multiplihandicapped populations. In fact, it appears as the severity of the handicap or retardation increases so does the incidence of visual deficits and problems. The technology and knowledge is presently available and continues to develop in terms of diagnostic and treatment techniques for the visual evaluation of these children.

Therefore, it is our opinion, that it is essential that all infants identified as "at-risk" or handicapped, nonverbal mentally impaired pre-school children, and multiplihandicapped persons have comprehensive visual evaluations, as described above, prior to any special education planning and/or programs. It is extremely important that the special educator have as clear and precise picture as possible for the infant's or child's visual abilities and their relationship to the total educational program. When this did not occur in many cases, it has been our experience that, at best, many hours of wasted effort and frustration have resulted due to inappropriate activities being attempted both by the teacher and

Eye movements are assessed using specific patterns and techniques that stimulate and hold attention in order to see if all the eye muscles and the systems that control them can move the eyes up, down, left and right.

Refractive status is determined by the use of instruments, e.g., retinoscopes. If corrective lenses appear indicated, they may be prescribed in the form of plastic lenses or soft contact lenses designed specifically for the child. The improvement in visual acuity can often be measured using the preferred looking techniques.

Binocular vision including accommodation (focusing), convergence, and stereopsis (depth perception) is developed almost completely the fifth month of life. Techniques similar to those used in assessing visual acuity, refractive status, and oculomotility are utilized in the testing of binocular skills. Any interference in binocularity can result in strabismus (crossed eyes) or amblyopia (lazy eye). If strabismus is present and not treated in the first two years of life, the chances for normal binocular development in the brain is reduced greatly.

Finally, to ensure that the eye itself is healthy and intact, careful assessment with opthalmoscopes and biomicroscopes of the external parts of the eye, e.g., eyelids, cornea, conjuctiva, as well as the internal parts of the eye, e.g., lens and retina, is an absolute necessity as early as possible on all at-risk or handicapped infants.

Implications for Infant and Multihandicapped Special Education and Intervention Programs

parents, while, at worst, minimum or no activities were planned or attempted since there was a false belief that the child could not "see" or function visually.

ASSESSMENT OF THE MULTIHANDICAPPED CHILD

Procedures to assess the hearing sensitivity of older children and adults are well documented and provide conclusive information. Conversely, standard audiometric techniques cannot be used with the infant and multiplihandicapped child because of his immature development.

The pediatric hearing assessment is an ongoing process. Conclusive audiologic information can rarely be obtained in one test session. This necessitates the clinician's use of a battery of procedures. Behavioral as well as electrophysiologic techniques have proven clinical utility for infants and multiplihandicapped children.

As an alternative to convential adult procedures, infants and young children are usually testing with an observational technique. With the presentation of a stimulus, a change in the infant's ongoing behavior is noted and credited as a response. This form of testing, called behavior observation audiometry (BOA), is the most widely practiced clinical procedure used with infants today.

As a child matures, his response to auditory stimuli become more reliable, thus making the presence of a possible hearing impairment more readily indentifiable.

A procedure titled Conditioned Orientation Reflex (COR) has been

utilized with young children with reported success. The COR technique is described as placing a child between two loud-speakers in a sound-treated room and presenting an auditory stimulus from alternating speakers. If a child responds by turning toward (localization) the speaker when a signal is produced, an estimate of hearing sensitivity can be obtained.

Variations of the COR technique have been suggested using animated mechanical toys for visual reimforcement of localization.

Other researchers (Liden & Kankkunen 1969) suggest the use of visual reinforcement not only for a localization response but for vocalization, smile, investigatory response or reflexive activity like startle or an eye blink (APR).

The procedures mentioned above allow the examiner to identify normal hearing children. Further, for those children with hearing loss, a good approximation of hearing impairment in the better ear can be obtained.

By the age of 2 years, some children can be conditioned to respond to pure tone audiometry via a play response to a stimulus (for example, placing a ring on a peg when a tone is heard) or through a tangible reinforcement paradigm. Various "play audiometric" techniques can be utilized to keep a child's attention and gain valuable audiologic information. Audiotory threshold (air and bone) can be obtained, keeping in mind that more than one session may be necessary to complete an audiogram. Speech audiometric testing can also be done successfully using picture tests or children's word lists. Again, the child's age and maturity level will dicate the type of speech audiometric material used.

Electroacoustic Impedance is a necessary part of any pediatric hearing assessment. This objective measurement provides information about the status of the conductive mechanism and corroborative evidence about auditory sensitivity and sensorineural levels (Hodgson, 1978).

Impedance has its limitations, the primary one being that a child must remain quiet and relatively immobile during the test period. A skilled clinician experienced in child testing should be available for this procedure. Lastly, it should be pointed out that tympanometry and acoustic stapedial reflex measurements must be complemented by a behavioral test battery: only then can results be interpreted and diagnosis made.

Brainstem evoked response is an objective hearing test procedure that records neural activity of the auditory nerve and brainstem nuclei.

A target electrode is placed on the vertex with a ground at the forehead and a companion at the earlobe. The stimulus used is a click or extremely brief tone presented two and one-half to ten times per second. All procedures are identical to electrocohleography except for the placement of the target electrode. In interpreting results, the potentials recorded are averaged, and the peaks generated refer to different areas from the VII nerve to the medial geniculate and primary auditory cortex. Examination of the fifth wave or peak, speculated to arise from the inferior colliculus, is most useful for audiologic purposes. The child being tested can either be awake or alseep; no sedation is necessary in this procedure. BSER is a useful audiologic measurement.

If a child is identified as having a hearing impairment, he should first be referred to a physician if he has not seen one earlier. Then a hearing aid evaluation should be scheduled to determine the best amplification system for that child.

Extensive programming with parents and teachers must be done to insure understanding of hearing loss, hearing aids, etc. Further, a speech and language evaluation dhould be arranged to assess the effect the hearing loss has had upon the development of the child's communicative abilities.

SPEECH AND LANGUAGE ASSESSMENT

The evaluation of the communicative abilities of the young multihandicapped youngster is an integral part of the total diagnostic. Assessment tools like the Bayley Scales of Infant Development, Assessing Language Skills in Infancy (Bzock & Leauge, 1971) and the Sequenced Inventory Communication Development (Hendrick, Prather, Tobin, 1975) are standarized measures which will give the examiner an age level or a functioning level in both receptive and expressive language skills. However, in most instances, as the test items evaluate skills at the higher age levels, the child must respond appropriately to the stimulus in order to advance in the assessment.

Unfortunately a large proportion of multi-handicapped children do not cooperate in the formal test setting. Many of these children cannot attend to standardized test procedures which are necessary in order to complete the assessment battery.

The speech pathologist and other professionls who are part of the diagnostic team must often rely on informal evaluative methods to accurately assess the communication skills of the multihandicapped yhoungster. Roger Brown has made a major contribution to this area with his research in normal language develcpment. A spontaneous language sample obtained in an informal play setting will often yield valuable information regarding the expressive abilities of a child. The examiner must be aware of the standardized norms which have been developed as a result of his work. Samples of functioning levels of

both syntactic and semantic development are included in appendix and appendix 2.

Unfortunately, it is not unusual for the multihandicapped child to be non-verbal or produce unintelligible utterances. In cases like this, it may be necessary to examine the pragmatic aspect of the child's communication skills. Pragmatics refers to the use and intent of the child's communication attempts. The pragmatic function can be seen in an infant when the child demonstrates the beginning of turn taking such as repeating his or her vocalization when the parent imitates the child. The infant then begins to look at what the adult looks at which is referred to as mutual gaze or joing attention to objects. Gazing, laughing and non-verbal intentional behaviors such as reaching, and giving objects back and forth to parent occur during the first year of life in the normal youngster.

True intentional non-verbal communication acts such as reaching, pointing, showing and giving are demonstrated in the behavior of a 12 to 18 month old child. The examiner can easily assess these functional communication acts in an informal setting. Too often these obvious attempts at true communication are overlooked by the diagnostic team.

The verbal child will demonstrate appropriate pragmatic skills with verbal turn taking occurring between 18 and 24 months. Other behaviors which may be included in the assessment of an 18 to 36 month old include labeling, responsing, greeting, protecting, repeating and describing. Some multihadicapped children may have fairly well developed non-verbal pragmatic skills but may be severely delayed in expressive language. The important component of

pragmatics should be a part of any communicative assessment of a young multi-handicapped child.

When a child fails to demonstrate any meaningful communicative skills, it will be necessary to rely on a cognitive assessment to evluate his/her pre-language level. The speech and language pathologist utilizes the work of Jean Piaget to determine the current level of functioning in the non-verbal child. It will be necessary to develop and implement a management program at the child's cognitive functioning levels in order to facilitate language acquisition. The child must have reached a level V in the sensory motor stage of development before meaningful communicative abilities can begin to develop. Uzgiris & Hunt (1975) have included an assessment system based on the work of Piaget in their text, Assessment in Infancy: Ordinal Scales of Psychological Development. Where traditional tests have presumed a predetermined rate of development, Uzgiris & Hunt have devised ordinal scales in order to have better tables with which to investigate the effects of infants' encounters with various kinds of circumstances on the rate of their development. The multihandicapped child has encountered numerous obstacles in his/her developmental milestones. In utilizing the Uzgiris & hunt scales the examiner also may compare the degree to which one infant is advanced or retarded with respect to others on each of the various scales in terms of how his/her age compares with the ages of others at the same level of development.

The speech and language pathologist on the diagnostic team must be flexible and ready to utilize all available materials in evaluating the difficult to assess multihandicapped child.

In the future, hopefully we can see the development of these infants and children to their maximum potential. However, this will only occur by open communication, sharing of ideas, and implementation of new techniques by all professions involved with the responsibility of evaluating and treatment these children.

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